GSM/GPRS/GPS Tracker **GV320**

User Manual

TRACGV320UM001

Revision: 1.02



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Revision History

Revision	Date	Author	Description of change
1.01	2012-05-07	Owen Feng	Initial
1.02	2012-08-14	Leaf Ye	Add uart Garmin connection

1 Introduction

The GV320 is a powerful GPS locator designed for vehicle or asset tracking. It has superior receiver sensitivity, fast TTFF (Time to First Fix) and supports Dual-Band GSM frequencies 850/1900, its location can be monitored in real time or be periodically tracked by a backend server or other specified terminals. The GV320 has multiple input/output interfaces that can be used for monitoring or controlling external devices. Based on the integrated @Track protocol, the GV320 can communicate with a backend server through the GPRS/GSM network to transfer reports of Emergency, geo-fence boundary crossings, low backup battery or scheduled GPS position as well as many other useful functions. Users can also use GV320 to monitor the status of a vehicle and control the vehicle by its external relay output. System Integrators can easily setup their tracking systems based on the full-featured @Track protocol.

This device complies with part 15B, part 22 and part 24 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference

(2) this device must accept any interference, including interference that may cause undesired operation.

1.1. Reference

Table 1. GV320 Protocol Reference

SN	Document name	Remark
[1]	GV320 @Track Air Interface Protocol	The air protocol interface between GV320 and backend server.

1.2. Terms and Abbreviations

Table 2. Terms and Abbreviations

Abbreviation	Description
AGND	Analog Ground
AIN	Analog Input
DIN	Digital Input
DOUT	Digital Output
GND	Ground
MIC	Microphone
RXD	Receive Data
TXD	Transmit Data
SPKN	Speaker Negative
SPKP	Speaker Positive

2 Product Overview

2.1. Check Part List

Before starting, check all the following items have been included with your GV320. If anything is missing, please contact your supplier.



Figure 1. Appearance of GV320

2.2. **Parts List**

Table 3. Part List

Name	Picture
GV320 Locator	80*49*26 mm
User Cable	
Extend Cable (Optional)	
GPS Antenna (Optional)	
DATA_CABLE_M (Optional)	

2.3. **Interface Definition**

The GV320 has a 16 PIN interface connector. It contains the connections for power, I/O, RS232, microphone, speaker, etc. The sequence and definition of the 16PIN connector are shown in following figure:

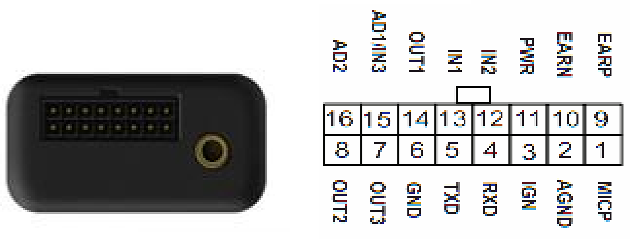


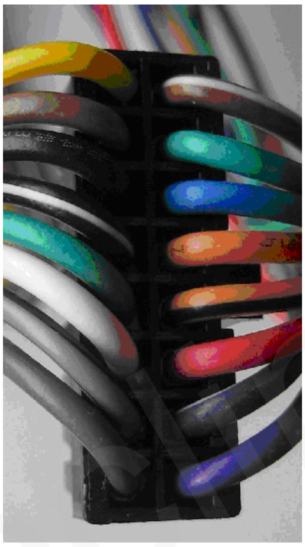
Figure 2. The 16 PIN connector on the GV320

Table 4. Description of 16 PIN Connections

Index	Description	Comment
1	MICP	Single end, 2-2.2k microphone, internal bias
2	AGND	Analog ground
3	IGN	Ignition input, positive trigger
4	RXD	UART RXD, RS232
5	TXD	UART TXD, RS232
6	GND	Power and digital ground
7	OUT3	Open drain, 150mA max
8	OUT2	Open drain, 150mA max
9	EARP	Differential output, 32ohm 1/4w speaker
10	EARN	
11	PWR	External DC power input, 8-32V
12	IN2	Digital input, negative trigger
13	IN1	Digital input, negative trigger
14	OUT1	Open drain, 150mA max ,with latch circuit
15	AD1/IN3	Multifunction input, analog or digital input 0-16V
16	AD2	Analog input 0.3-16v

2.4. **GV320 User Cable Colour**

Table 5. GV320 User Cable Colour definition

Definition	Color	PIN No	Cable	PIN No	Color	Definition
OUT2	Yellow	8		16	Brown/White	AD2
OUT3	Brown	7		15	Green	AD1/IN3
GND	Black	6		14	Blue	OUT1
TXD	White/Black	5		13	Orange	IN1
RXD	Green	4		12	Orange/Black	IN2
IGN	White	3		11	Red	PWR
AGND	Gray/ Black	2		10	Purple/White	EARN
MICP	Gray	1		9	Purple	EARP

3 Getting Started

3.1. **Opening the Case**



Figure 3. Opening the Case

Insert the triangular-pry-opener into the gap of the case as shown below, push the opener up until the case unsnapped.

3.2. **Closing the Case**



Figure 4. Closing the Case

Place the cover on the bottom in the position as shown in the following figure. Slide the cover against the direction of the arrow until it snapped.

3.3. **Installing a SIM Card**

Open the case and ensure the unit is not powered (unplug the 16Pin cable and switch the internal battery to off position). Slide the holder right to open the SIM card. Insert the SIM card into the holder as shown below with the gold-colored contact area facing down taking care to align the cut mark. Close the SIM card holder. Close the case.

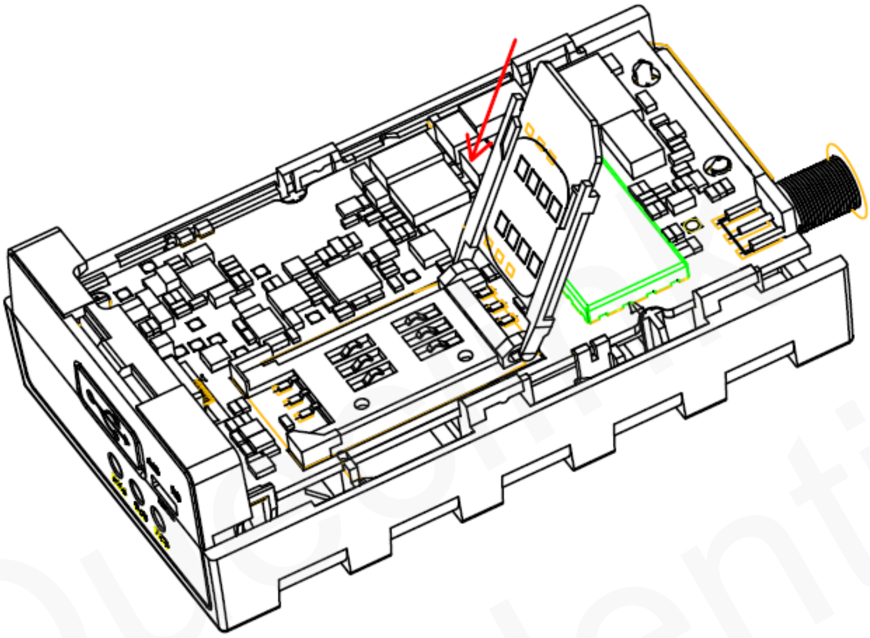


Figure 5. SIM Card Installation

3.4. **Installing the Internal Backup Battery**



Figure 6. Backup Battery Installation

There is an internal backup Li-ion battery,

3.5. **Switch ON the Backup Battery**

To use the GV320 backup battery, the switch must be at the ON position. Switch on the case and ON/OFF position are shown below.



Figure 7. Switch and ON/OFF position

Note:
1-The switch must be on the "OFF" position when shipped on an aircraft.
2-When the switch is on the "OFF" position, the battery cannot be charged or discharged.

3.6. **Installing the External GPS Antenna (Optional)**

There is a SMA GPS antenna connector on GV320. The GV320 will automatically detect and use an external antenna when connected.



Figure 8. GPS Antenna of GV320

3.6.1. GPS Antenna Specification

Table 6. GPS Antenna Specification

GPS antenna:	Frequency: 1575.42MHz
Bandwidth:	>5MHz
Beam width:	>120 deg
Supply voltage:	2.7V-3.3V
Polarization:	RHCP
Gain:	Passive: 0dBi min Active: 15dB
Impedance:	50Ω
VSWR:	<2
Noise figure:	<3

3.7. Power Connection

PWR (PIN12) / GND (PIN6) are the power input pins. The input voltage range for this device is from 8V to 32V. The device is designed to be installed in vehicles that operate on 12V or 24V systems without the need for external transformers.

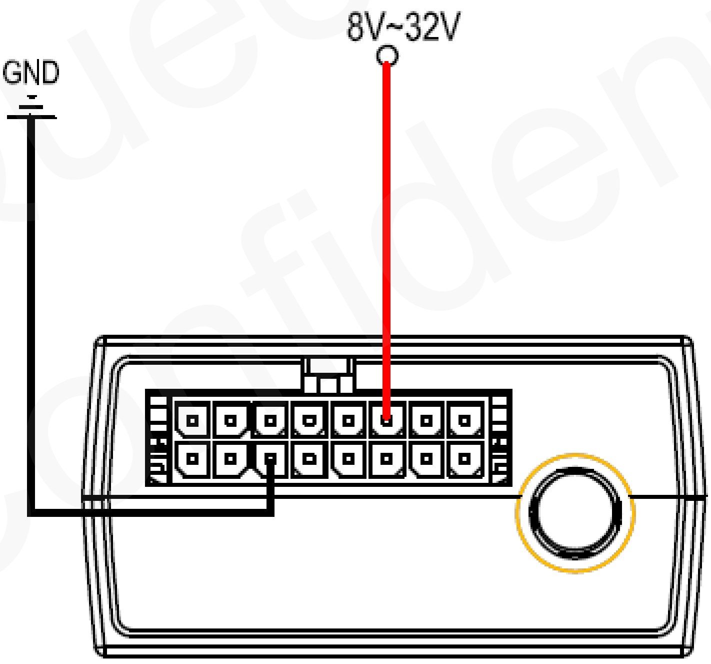


Figure 9. Typical Power Connection

3.8. Ignition Detection

Table 7. Electrical Characteristics of Ignition Detection

Logical State	Electrical State

Active	5.0V to 32V
Inactive	0V to 3V or Open

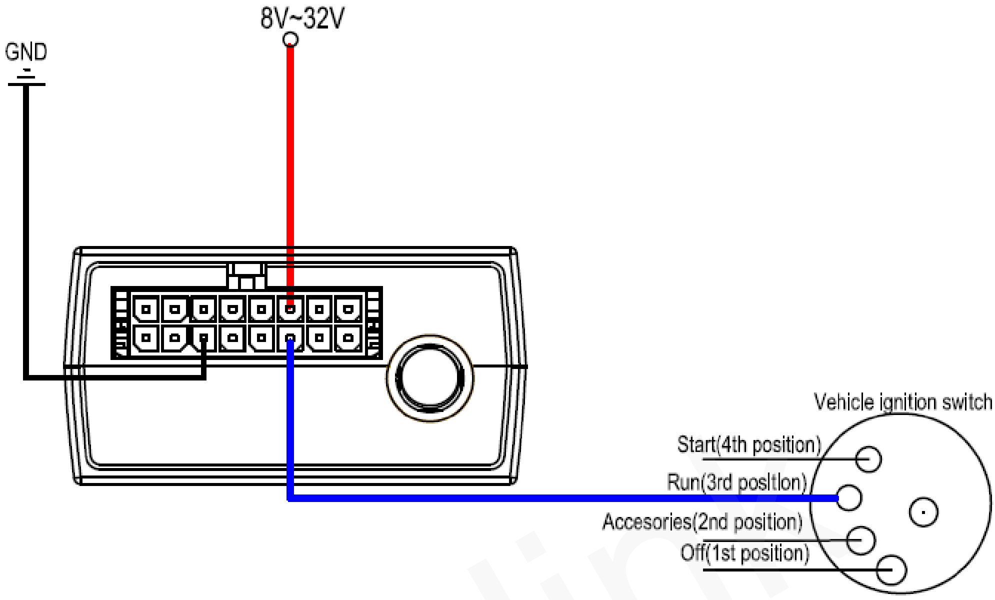


Figure 10. Typical Ignition Detection

IGN (Pin3)is used for ignition detection. It is strongly recommended to connect this pin to ignition key "RUN" position as shown up.

An alternative to connecting to the ignition switch is to find a non permanent power source that is only available when the vehicle is running. For example the power source for the FM radio.

IGN signal can be configured to start transmitting information to backend server when ignition is on; and enter power saving mode when ignition is off.

3.9. Digital Inputs

There are three general purpose digital inputs on GV320. They are all negative trigger.

Table 8. Electrical Characteristics of the digital inputs

Logical State	Electrical Characteristics
Active	0V to 0.8V
Inactive	Open

The following diagram shows the recommended connection of a digital input.

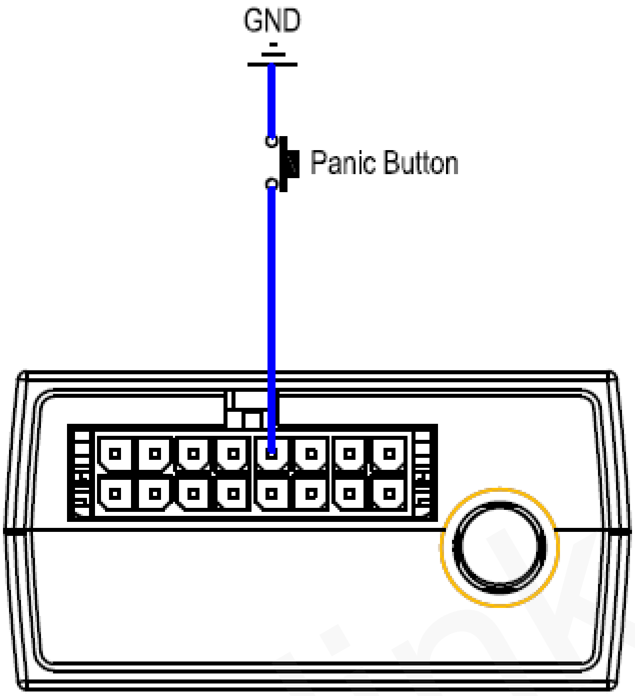


Figure 11. Typical Digital Input Connection

3.10. **Analog Inputs**

There are two analog inputs on GV320, the analog input voltage range is from 0 to 16V. The following diagram shows the recommended connection.

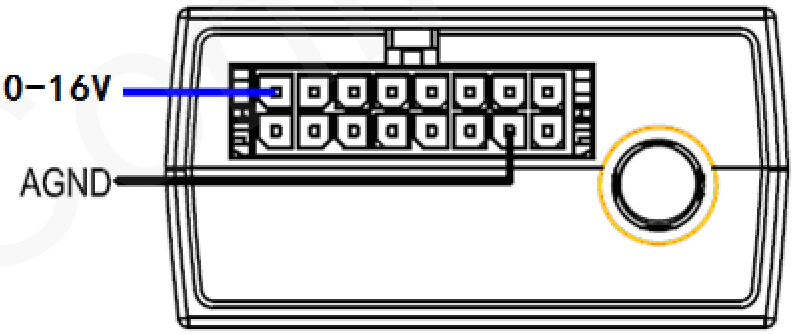


Figure 12. Typical Analog Input Connection

Note:
PIN 15 is an multifunction pin: it can be configured as a digital input or an analog input.

3.11. **Digital Outputs**

There are three digital outputs on GV320. All are of open drain type and the maximum drain current is 150 mA. Each output has the built-in over current and recovery PTC fuse

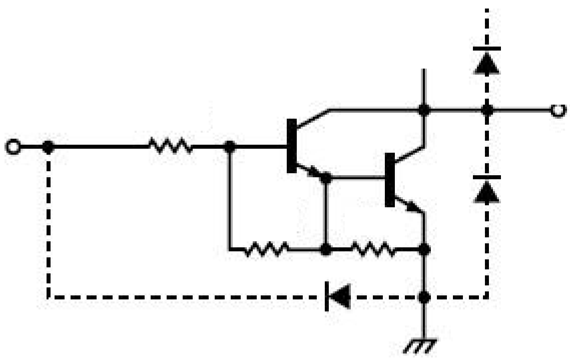


Figure 13. Digital Output Internal Drive Circuit

Table 9. Electrical Characteristics of Ddigital Outputs

Logical State	Electrical Characteristics
Enable	<1.5V @150mA
Disable	Open drain

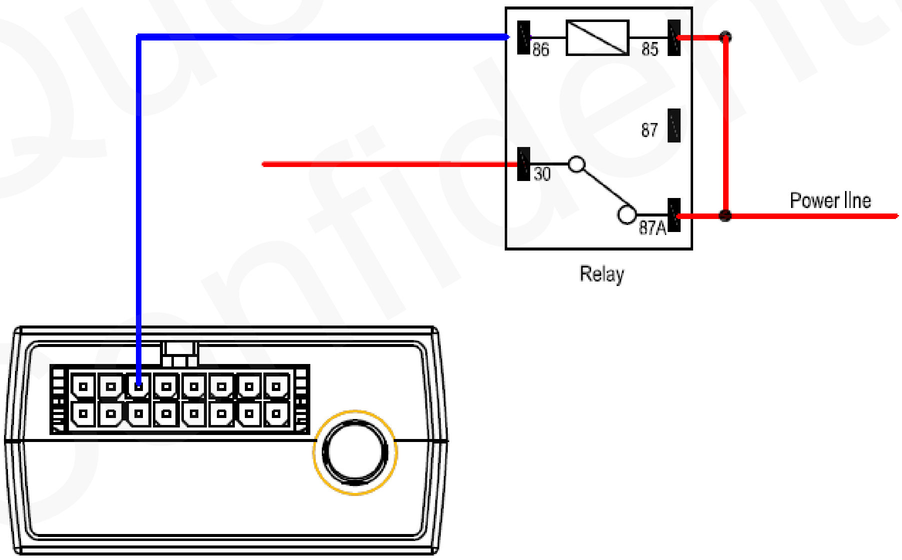


Figure 14. Typical Connection with Relay

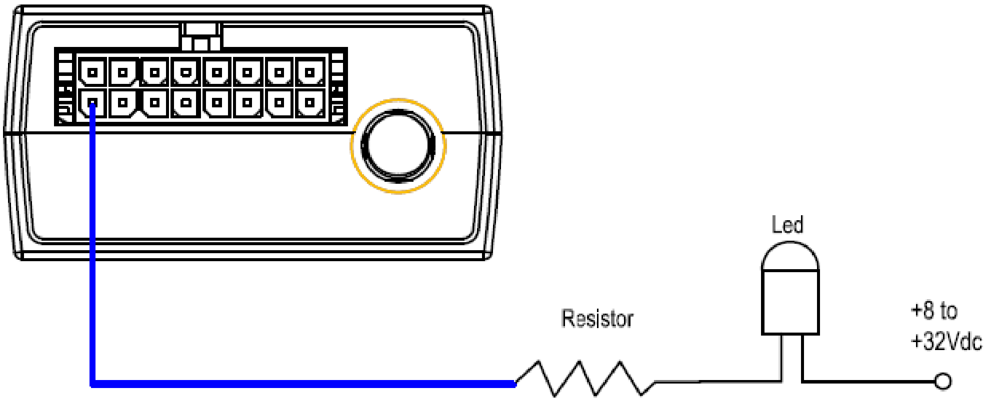


Figure 15. Typical Connection with LED

Note:

1 - OUT1 will latch the output state during reset.

2- All outputs are internally pulled up to PWR pin by a diode. So no external flyback diode is needed when the output is connected to an inductive load.

3.12. Device Status LED

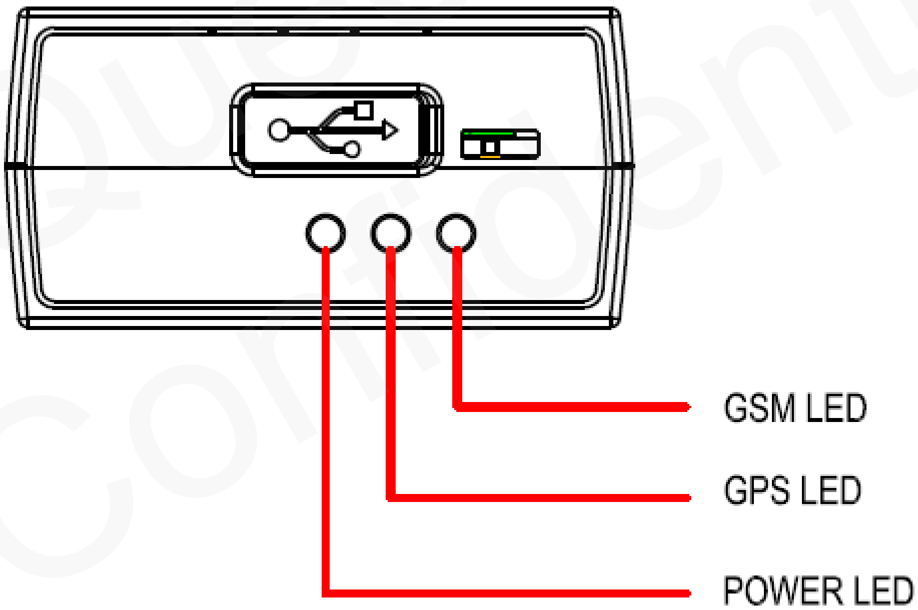


Figure 16. GV320 LED on the Case

Table 10. Definition of Device status and LED

Note:

LED	Device status	LED status
GSM (note1)	Device is searching GSM network	Fast flashing (Note3)
	Device has registered to GSM network.	Slow flashing (Note4)
	SIM card needs pin code to unlock.	ON
GPS (note 2)	GPS chip is powered off	OFF
	GPS sends no data or data format error.	Slow flashing
	GPS chip is searching GPS info.	Fast flashing
	GPS chip has gotten GPS info.	ON
PWR (note 2)	No external power and internal battery voltage is lower than 3.35V.	OFF
	No external power and internal battery voltage is below 3.5V.	Slow flashing
	External power in and internal battery is charging	Fast flashing
	External power in and internal battery is fully charged	ON

1 - GSM LED cannot be configured.
2 - GPS LED and PWR LED can be configured to turn off after a period of time using the configuration tool
3 - Fast flashing is about 60ms ON/ 780ms OFF
4 - Slow flashing is about 60ms ON/ 1940ms OFF

3.13. **Serial Port / UART Interface**

There are two lines dedicated to the Serial Port / UART interface (TXD and RXD).TXD / RXD are standard RS232 signal.

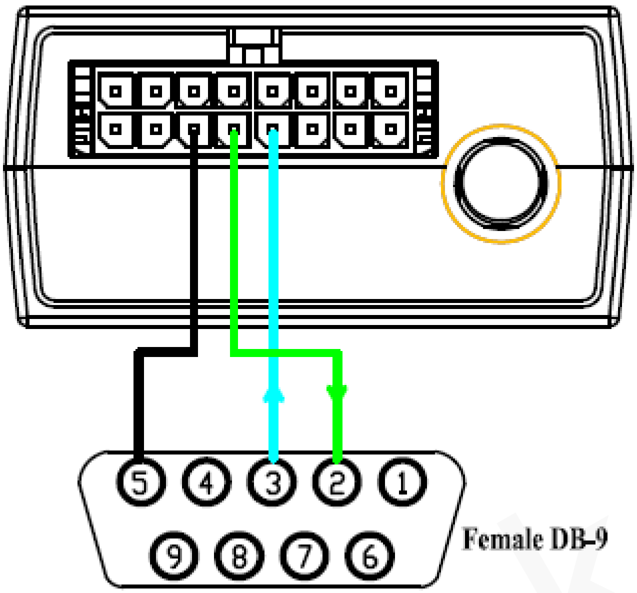


Figure 17. Typical Connection with RS232 Port

3.13.1 Connect With Garmin GPS Set

GV320 can communicate with Garmin GPS Set. The following typical connection is using Queclink AG100 cable.



Figure 1. GV320 connection with Garmin GPS set

Note: GV320 some version maybe connects with Garmin GPS set by Garmin FMI10/FMI15 cable, please consult with Queclink for detail information.